

## THREADED CLOSURE WITH TAMPER INDICATING RING

### RELATED APPLICATION

Reference is made to my copending provisional application serial number  
5 60/402,586; filed August 12, 2002 to which a claim of priority is made.

### BACKGROUND OF THE INVENTION

This invention relates generally to the field of tamper indicating  
threaded closures of a type normally used to seal glass and plastic containers for  
beverages. Such devices are well known in the art, and the invention lies in  
10 specific constructional details which provide improved tamper resistance, and  
assure a positive indication that the container has been previously opened.

In the many known constructions it is usual to provide a frangible  
interconnection between the tamper indicating ring and the lower edge of the side  
wall of the closure. The ring includes a plurality of inwardly directed  
15 pivotally mounted tabs which engage a lower edge of a corresponding bead on the  
container finish, so that the ring cannot move upwardly as the closure is  
unthreaded past a certain point at which the interconnected frangible bridges  
are broken. The ring usually remains in this position so that when the closure is  
re-engaged, the lower edge of the side wall abuts the upper edge of the ring,

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sometimes giving the appearance that the closure has not been previously removed. To facilitate molding, the tabs are conventionally molded axially outwardly of the tamper indicating ring, and after removal from the mold they are  
5 folded to roughly 180 degrees to lie within the periphery of the ring.

Although some prior art constructions have been reasonably effective, they do not address the problem of maintaining the tamper indicating ring in visibly separated condition after initial removal of the closure caused by the fact that the ring is thereafter capable of limited axial movement, and, in some cases,  
10 manual movement.

Another problem is that of preventing tampering by moving the tabs downwardly to permit removal of the closure without rupturing the frangible bridges which interconnect the tamper indicating ring to the lower free edge of the closure.

SUMMARY OF THE INVENTION

Briefly stated, the invention contemplates the provision of an improved tamper indicating closure of the type described, in which provision has been  
5 incorporated to provide improved tamper resistance, to ensure that the actuating tabs will operate in the so called first mode, and will, after limited unthreading of the closure, cause a visible separation of the closure and the tamper indicating ring. To this end, the actuating tabs are of elongated configuration, so that the upper end surfaces thereof are axially positioned above the frangible bridges  
10 which interconnect the tamper indicating ring with a lower edge of the side wall of the closure. The tabs are also provided with radially inwardly projecting ribs which form a shoulder or notch which engages the edge of the corresponding bead on the finish or neck of the container. After the closure and ring have separated, the ring will move axially downward, so that the upper ends of the tabs  
15 will slip under the rib. When the closure is rethreaded, a peripheral highly visible gap will be formed.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings, to which reference will be made in the specification,  
similar reference characters have been employed to designate corresponding parts  
5 throughout the several views.

Figure 1 is a fragmentary schematic sectional view showing a prior art  
construction.

Figure 2 is a corresponding fragmentary sectional view of embodiment of  
the invention.

10 Figure 3 is a sectional view of the embodiment showing certain parts  
thereof in altered relative position.

DETAILED DESCRIPTION OF THE DISCLOSED EMBODIMENT

Referring to Figure 1 in the drawing, there is illustrated a typical prior art closure 10 engaged with a container 11 having a threaded neck or finish with an outer threaded surface 13. An annular bead 14 is positioned therebeneath, and  
5 above a cylindrical surface 15 of the neck. A tamper indicating ring 16 is frangibly interconnected to the closure at a lower edge 17 of a side wall 18 which includes a serated outer surface 19 and a threaded inner surface 20. The ring 16 is separable from the closure by means of frangible bridges 22 formed in a slitting  
10 plane 23, as known in the art, and includes tabs 24, the upper edges 25 of which engage a lower surface 26 of the bead 14. When the closure is unthreaded, these tabs transmit a force to the frangible bridges, and the tamper indicating ring separates.

Referring to Figure 2 in the drawing, reference character 30 designates an improved closure embodying the invention. It includes a cylindrical side wall 31  
15 having a serated outer surface 32, a threaded inner surface 33, frangible bridges 34, slitting plane 35 and a tamper indicating ring 36. The ring includes a relatively thin upper portion 37 and a relatively thicker lower portion 38, and is bounded by an outer surface 39 and inner surface 40. A plurality of tabs 42 include a lower

tapered hinge portion 43 and a generally rectilinear upper portion 44, each bounded by an outer surface 45, and inner surface 46 as well as a transversely extending end surface 47 which meets the inner surface 46 in an edge 48. Each  
5 tab includes an inwardly projecting rib 50 which forms a notch or shoulder 51 into which the edge of the rib 52 is engaged when the closure is first installed. This position is obtained when the inner surface of the end wall of the closure (not shown) or a liner contacts the mouth at the free end of the bottle neck.

As illustrated in Figure 3, the closure has been partially unthreaded  
10 resulting in the breaking of the frangible bridges to disconnect the tamper indicating ring. At this point, as the ring falls, the end surface 47 of each of the tabs 42 will slide under the bead as a result of elastic memory of the hinge portion of the tab, and remain in this position thereafter. When the closure is re-engaged, the gap formed by this movement of the tamper indicating ring will remain  
15 clearly visible and extend around the periphery of the closure.

It is to be noted that the above operation is possible by the fact that the end surfaces 47 of the tabs 42 extend radially above the slitting plane 35 in which the frangible bridges 34 are formed. Thus, when the closure is first installed in integral condition, the tabs will be outwardly deflected and do not engage the  
20 bead on the container neck on a lower surface thereof, but only a peripheral

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surface which forms part of the shoulder or notch 49. Upward movement of the tabs when the closure is first unthreaded is due to engagement of the ribs 48 with the lower surface of the bead, and this force persists until all of the bridges are broken, so that an initial downward displacement of the tamper indicating ring occurs. This displacement is sufficient to permit the tabs to now engage the under surface of the bead on the closure, and it is this engagement which maintains the visible gap between the tamper engagement ring and a re-engaged closure. It should be noted that this construction may be employed with both containers made of glass and synthetic resinous materials.

I wish it to be understood that I do not consider the invention to be limited to the precise details of structure shown and described in the specification, for obvious modifications will occur to those skilled in the art to which the invention pertains.

I claim: